inally restricted to eroded tops and slopes of sandy-clay bluffs but seems to respond positively to disturbance, occurring sporadically in loose sand near roadsides and other sandy areas now believed to have been degraded by domestic grazing. Observations made in the spring of 1977 on a population in central Socorro Co. indicate that the species is not, or but little, grazed by cattle and horses on otherwise heavily used rangeland.

NYCTAGINACEAE

Selinocarpus palmeri Hemsl. Coahuila, 4 km by winding road E of El Coyote at NW end of Sierra de Solis, 25°40'N lat., 103°10'W long., elev. ca. 1100 m, on a large, almost pure gypsum outcrop, *R. Spellenberg* and *J. Syvertsen 3768,* 16 Aug 1974.

Until this new collection the species was known from only two others (*Palmer 1118, 1119,* May 1880, from San Lorenzo de Laguna). But perhaps more important is evidence of the precise location of Palmer's "San Lorenzo de Laguna", not to be located on modern maps. McVaugh (1956. Edward Palmer: plant explorer of the American West. Univ. Okla. Press) indicated that it should be in the near vicinity of the site from which our collection was taken. That our locality is also that of Palmer is supported by the occurrence of the newly described *Euphorbia fruticulosa* Boissier var. *hirtella* M. C. Johnston (Wrightia 5:141) with the *Selinocarpus,* our collection providing the holotype. M. C. Johnston (pers. comm.) subsequently discovered a specimen of this variety in the Gray Herbarium collected by Palmer at "San Lorenzo de Laguna".

OPHIOGLOSSACEAE

Botrychium matricariifolium A. Br. New Mexico, Catron Co., Gila Wilderness, ca. 16 km by air ESE of Mogollon, on Crest Trail 182, 4 km SE of Sandy Point, in mature spruce-fir-aspen forest, N slope, 3033 m elev., *R. Spellenberg, J. Reitzel, D. Hill 4528,* 5 Sep 1976.

This record is the first for this species in the state and is the southernmost record for the genus in New Mexico.

POACEAE

Muhlenbergia villosa Swallen. New Mexico, Otero Co., Otero Mesa NE of Orogrande, Sec 7 or 18, T24W, R11E, elev. 1775 m, *R. Spellenberg 4565,* 24 Sep 1976.

The species is said to be endemic to Texas and to occur there only extremely locally, apparently confined to gypsum, near the SW corner of the panhandle (F. Gould. 1975. The Grasses of Texas. Texas A & M Press). The newly discovered population was vigorous, on soil derived from limestone, occurring in scattered but dense patches over an area of about 25 m^2. The species is listed in the 6/16/76 Federal Register for Texas as "endangered".

Urochloa panicoides Beauv. New Mexico, Las Cruces, New Mexico State University campus, weedy lawn, *R. Spellenberg 4480,* 26 Aug 1976.

Mr. José Valls, a student of Dr. Frank Gould, kindly identified this collection. It appears to be the first U. S. record for this Asian and African grass, now introduced elsewhere in warm parts of the world. At this point it appears to be only adventive. — Richard Spellenberg, Department of Biology, New Mexico State University, Las Cruces 88003.

Irregularity of Pinyon Cone Production and Its Relation to Pinyon Cone Moth Predation. — *Eucosma bobana* Kearfott (Lepidoptera: Tortricidae) larvae are prey-specific predators of maturing ovulate cones of *Pinus edulis* Engelm. and *P. monophylla* Torr. & Frem. (Powell, Hilgardia 39:1–36. 1968). Thus the number of ovulate cones annually produced in pinyon woodlands may determine, in part, the potential population densities of cone moths. In turn, the number of pine cone moths produced in any one year may affect the production of viable pine seeds in the next year.

Eight *P. monophylla–Juniperus osteosperma* (Torr.) Little woodlands in southern Idaho and northern Nevada (U. S. A.) were visited during the winter and spring of 1977. Because ovulate cones leave abscission scars at the annual whorls of actively growing leader shoots, I could estimate a cone production sequence for the 1968–1977 period by the following method: sample five trees within a pinyon community and count all potential cone-bearing leader shoots within those trees; then subsample five leader shoots from each tree and count the abscission scars and currently maturing cones at the annual whorls of each leader shoot. By using the total pinyon canopy coverage of a 600 m^2 plot that contained the five sample trees, these data can be used as a basis for estimation of a 10-year cone production sequence on a unit-area basis for the entire pinyon population (cf. Gorchakovskii, Bot. Zurn. 43:1445–1459. 1958). The sample numbers used in this method have been shown to be adequate in a previous study (Forcella, Thesis — Montana State U., Bozeman 59715, p. 53. 1977; Weaver and Forcella, in prep.).

The accuracy of this method can be checked by comparing the abscission scar estimate of the 1976 cone crop with the number of "freshly" abscised cones found on the ground within the 600 m^2 plot (occasionally cones fail to abscise from the leader shoots, but these can be easily counted in most cases since the trees are only 3–5 m in height). The two methods compare favorably ($r^2 = 0.95$, $n = 7$, $p = 0.01$).

These freshly fallen cones can also be used to estimate the extent of predation upon them. Cones infested with *E. bobana* larvae or pupa cases (normally one/cone in the several tens of cones I checked) abort before maturity and possess telltale entry-exit holes. Rodent-molested cones often exhibit chewing marks and are frequently left in piles at the bases of trees directly below feeding platforms. Cones ravaged by birds, notably pinyon jays *(Gymnorhinus cyanocephalus)* and Clark's nutcrackers *(Nucifraga columbiana)* have a generally shredded appearance.

In 1976, four of the sampled stands had cone crops well above their 10-year averages. Two of these stands also had average or above average cone crops in 1975, while the other two stands had 1975 cone crops that were only about 50% of their averages. The 1976 cones in the two stands with consecutively abundant crops were heavily utilized (80% and 50%) by *E. bobana* larvae; an additional 10–20% were preyed upon by other animals. In contrast, the abundant 1976 cones of the two stands with below average 1975 crops were only mildly infested with cone moth larvae (20% and 17%) and showed insignificant utilization by other sources. A significant correlation exists between the current magnitude of cone moth depredation and the abundance of the previous year's cone crop (Fig. 1). A similar situation occurs with *Pinus rigida* and its cone predators (Mattson, Canad. Entomol. 103:617–621. 1971).

Such evidence for prey-frequency dependent predation indicates that consecutively good (above average) cone crops in pinyon are not selectively advantageous. Instead for pinyon, fewer cones, but these produced at strategic intervals, may confer fitness. The overall annual cone crops in pinyon communities are highly irregular (C. V. = 94 ± 32% for the eight Great Basin stands). Above average cone crops occur in only two or three out of ten years in Great Basin pinyons, and these good crops appear to be randomly distributed within the 10-year sequence investigated. In the same 10-year period *P. monophylla* communities south of N 136° 20′ (southern Calif., southern Nevada, and the Santa Ancho Mts., Arizona) had good cone crops only once or twice, and their C. V.'s are correspondingly somewhat higher (112 ± 24%, n = 7; unpublished data). Such irregularity in cone production may have selective advantages by keeping the predator populations small through a low average annual cone (mast) crop, thus insuring predator satiation and seed survival in years of good cone crops.

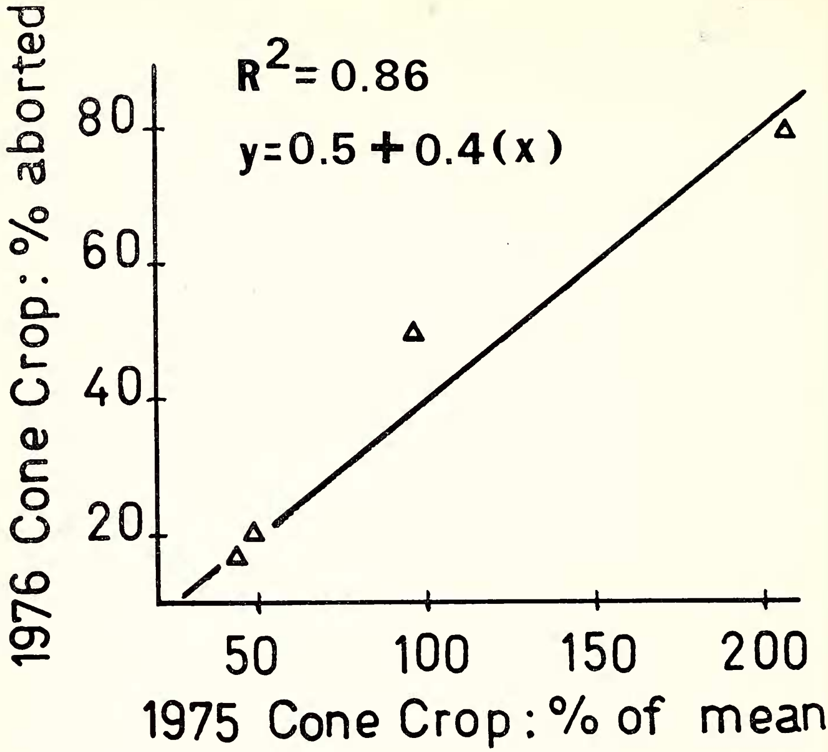

Fig. 1. The relative utilization of pinyon cone crops by *Eucosma bobana* (pinecone moth) larvae as a function of the magnitude of the previous year's cone crop. The y-axis represents the percent of the 1976 cone crop that was aborted due to larval infestation. The x-axis represents the 1975 cone crop as a percent of the average of a 10-year cone production sequence for each *Pinus monophylla* community. If all cone predators were included in the analysis the slope of the regression line would be about 0.5.

K. T. Douglass, A. F. Johnson, P. G. Risser, and T. Weaver were all kind enough to edit and comment on the original version of this report. — Frank Forcella, Department of Biology, Montana State University, Bozeman 59715 (Current address: Department of Botany-Microbiology, University of Oklahoma, Norman 73019).

Notes on the Flora of East-central Idaho. — Although excellent treatments of much of Idaho's flora have been published (Davis, *Fl. Idaho,* 1952; Hitchcock et al., *Vasc. Plants Pacific Northw.,* 1955–1969, and Hitchcock and Cronquist, *Fl. Pacific Northw.,* 1973), some areas within the state remain relatively unknown floristically. With funding made possible by a C. R. Stillinger Grant, intensive botanical exploration of parts of east-central Idaho (Lost River, Lemhi, and Beaverhead Ranges of Custer, Lemhi, Butte, and Clark Counties) was initiated in the summer of 1973. As a result of three collecting seasons in the region, several plants worthy of mention have been encountered. Collection numbers are those of the author; specimens are deposited in ID.